L6(6.1) - Solving Quadratic Equations

Recall:

To solve an equation, find value(s) that satisfy the equation (i.e., make it true).

This value is called the solution or root of the equation.

Zeroes

Ex.1 Solve $x^2 - 12x + 32 = 0$

M A U
32 -12 -8 -4

$= x^2 - 8x - 4x + 32 = 0$

$= x(x-8) - 4(x-8)$

$= (x-4)(x-8)$

OR

$x-4=0$ $x-8=0$

$x=4$ $x=8$

Apr 19-7:41 PM

We have most often solved for the zeroes of the quadratic equation, but we can solve for any value.

Ex.2 Solve $y = 2x^2 + 5x - 12$ for

(a) $y = 0$ (b) $y = -12$

M A U
-24 5 +8 -3

$0 = 2x^2 + 5x - 12$

$0 = 2x^2 - 3x + 8x - 12$

$0 = x(2x-3) + 4(2x-3)$

$0 = (2x-3)(x+4)$

OR

$2x-3=0$ $x+4=0$

$2x=3$ $x=-4$

$x=\frac{3}{2}$

$-12 = 2x^2 + 5x - 12$

$-12+12 = 2x^2 + 5x$

$0 = 2x^2 + 5x$

$0 = x(2x+5)$

OR

$x=0$ $2x+5=0$

$\frac{2x}{2} = \frac{-5}{2}$

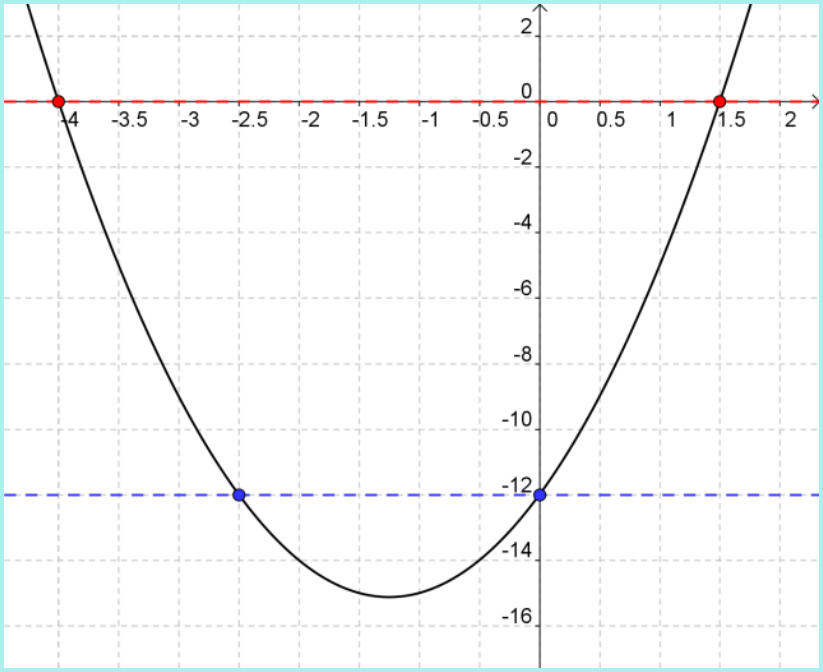
$x=-\frac{5}{2}$

$(0, -12)$

$(-2.5, -12)$

Nov 22-7:19 PM

Ex.2 Solve $y = 2x^2 + 5x - 12$ for (a) $y = 0$
(b) $y = -12$



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To solve using factored form:

1) Expand all terms

2) Move all terms to one side of the equal sign so that the equation equals zero

3) Factor your expression (if possible)

4) Set each factor equal to zero and solve

Ex.3 Solve: $x^2 - 10 = -x(2x + 13)$

$x^2 - 10 = -2x^2 - 13x$

$0 = -2x^2 - x^2 - 13x + 10$

$0 = -3x^2 - 13x + 10$

$0 = -3x^2 - 15x + 2x + 10$

$0 = -3x(x+5) + 2(x+5)$

$0 = (-3x+2)(x+5)$

M A N
-30 -13 $-15+2$

$\frac{-15}{-3}$ $\frac{2}{-3}$

$+5$ $\frac{2}{-3}$
$+1$

or

$-3x+2=0$

$\frac{-3x}{-3} = \frac{-2}{-3}$

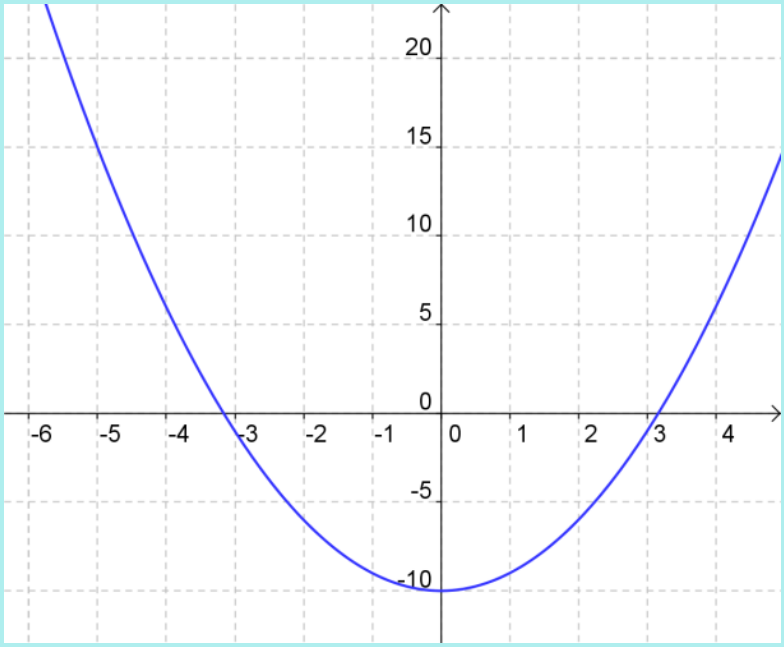
$x = \frac{2}{3}$

$x+5=0$

$x=-5$

Mar 29-11:52 AM

$y = x^2 - 10$



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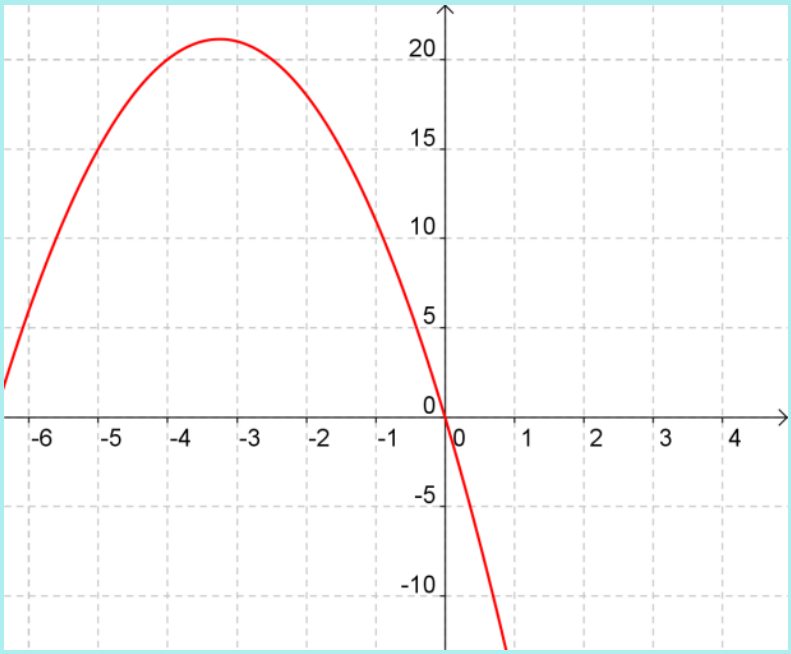
$y = -x(2x + 13)$



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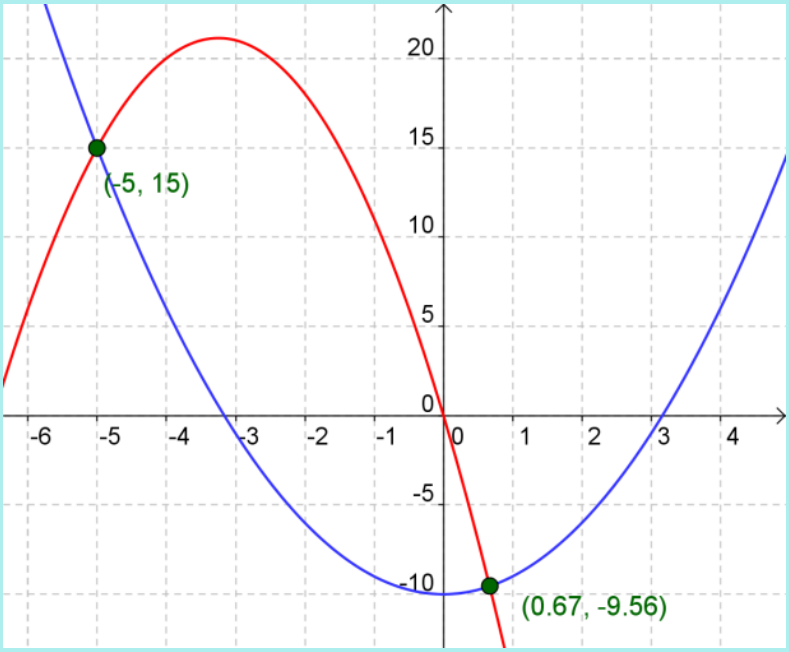
$x^2 - 10 = -x(2x + 13)$

which became .....

$3x^2 + 13x - 10 = 0$

$(x + 5)(3x - 2) = 0$



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Assigned Work:

p.320 # 4ac, 6ace, 7ace, 11